

The Citrus Industry

FLORIDA'S EXCLUSIVE
CITRUS MAGAZINE...

THIS PLEDGE WILL
LEAD US TO
VICTORY

"I Pledge Allegiance to the Flag
of the United States of America
and to the Republic for which
it stands; One Nation, indivisi-
ble, with liberty and justice for
all."

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JULY, 1942

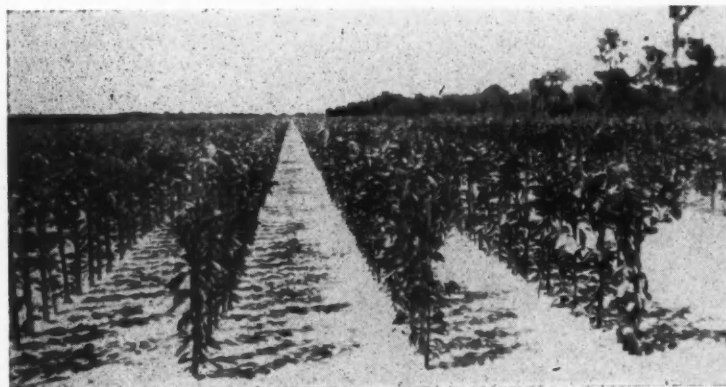
Vol. 23 — No. 7



Budding



The New Buds



One-Year Buds



Two-Year Buds

Four Stages In A Well Kept Nursery

To be more specific, these pictures were made in Lake Garfield Nurseries and we would like to show you these four stages right now, however, the budding season is over and we could not show you the budding at present.

The Rainy Season Has Started

And, it is a good time to plant those skips, fill out those corners and fence rows you grubbed out, as well as plant any other land you now have ready. By planting now you should get almost twice as much growth by the end of next year, than if you plant next spring.

Summer Special

We offer all varieties we have of Oranges and Grapefruit on Sour Orange Stock, and all Grapefruit on Rough Lemon, including Pinks, in lots of 100 or more trees at reduced prices.

We are glad to announce that we now have on Rough Lemon Stock some Hamlin, Pineapple, Jaffa, Valencia and Lue Gim Gong Oranges ready for delivery in the one-half inch and five-eighths inch sizes. Regular prices.

Placing Of Orders Now For Next Winter Is Recommended

Some varieties, especially on Rough Lemon Stock, are going to be scarce next winter, and it would be well for anyone who is going to plant to secure the trees wanted in advance.

Write or phone us your
requirements - Phone 460

**Lake Garfield
Nurseries Company**

Bartow, Florida

The Insecticide Situation...

By R. H. F. DADE, Jacksonville
AT THE 55TH ANNUAL MEETING FLORIDA STATE
HORTICULTURAL SOCIETY

In this discussion of insecticides I shall include materials used in connection with the spray and dust programs, but which have little or no direct insecticidal or fungicidal value. I refer particularly to Zinc and Manganese, used primarily as nutritional.

Since the role of the insecticide industry is little different now from in peace times, I believe your interest is largely in whether you are going to be able to get reasonable supplies of insecticides necessary to protect your crops.

As is the case with most other commodities, the basic raw materials from which insecticides are made enter very definitely into the manufacture of war implements. Look at a list of the items: Lead, Copper, Zinc, Manganese, Sulphur, Oil, etc., etc. Most of these items have been under more or less strict priority for some time. Therefore, from the standpoint of raw materials alone, we cannot expect an overabundance of all insecticides. My own personal opinion, however, is that there will be reasonable supplies of the type materials required by Florida growers to take care of our crops.

Taking the materials in the probable order of their importance to Florida, I will outline my views on the situation.

Sulphur: There are ample supplies of Sulphur. Transportation is the only bottleneck here, but so long as rail facilities are maintained from the Louisiana and Texas mines the supply should meet every reasonable demand. In the case of Liquid Lime Sulphur, the matter of steel drums may become very serious. This problem will be discussed later.

Oil Sprays: Here again transportation appears to be the only difficulty. This may be more of a problem than now appears, because of the necessity for tank cars. There is also the matter of steel drums in which the finished product is packed. Certain emulsifying agents are almost impossible to get, but satisfactory substitutes are available. I would, therefore, say that with the conservation of drum supplies we should have sufficient Oil Sprays to take care of the situation.

Copper: Up to the present time

there have been ample supplies of Copper in one form or another. Bluestone has not been too plentiful, as some manufacturers have devoted their productive capacity to the higher analysis forms of Copper. As sprays and dusts the insoluble Coppers are at least as effective, usually safer than Bluestone mixtures, and they conserve packages and transportation facilities. Bluestone is the only form of Copper which is practicable for ground application, and if supplies are short it should be conserved for the purpose.

We do not believe you are going to be able to get ten tons when your normal requirements have been five—unless you can show the necessity for the additional tonnage. Then too, you probably won't be able to lay in a season's supply all at one time. In general, however, I feel you will be able to get what Copper is necessary to protect your crops and supply the desirable amounts for nutritional purposes.

Zinc: Most of the Zinc used in Florida is in the form of Zinc Sulphate. Much of this is recovered in the nature of a by-product. This type of supply will doubtless continue to be available as the recovery is practicable only in the form of sulphate.

The use of Zinc Sulphate in agriculture has increased so tremendously during the past ten years that we may run into a shortage. However, a considerable tonnage used on some crops is not absolutely essential and may be reduced or discontinued altogether.

Mr. Kramer's Committee, of the Defense Council, and Dr. Camp have convinced the authorities in Washington that Zinc is very essential to Florida crops, and I feel that reasonable quantities will be released for our use. In general, however, Zinc worries me more than anything else at the present time.

Manganese: A far greater tonnage of Manganese is used in fertilizers than is applied as spray or dust. However, the same results may be accomplished in spray or dust form with much less material. In the case of citrus, this often entails an extra application of Oil and is not recommended unless very prompt action is necessary.

Much of the ore from which Manganese Sulphate is made has come from the South Pacific, but other deposits are becoming more readily available. Some of the product from these ores contains more or less Iron Sulphate, but probably not in sufficient quantities to be objectionable. In fact, there are cases where it might be desirable.

I believe there will be reasonable supplies of Manganese. It may be necessary to reduce the poundage in ground applications but you should be able to get what is necessary, either in your fertilizer or spray material.

Arsenicals: Fortunately, Florida is not a large consumer of Arsenicals and, further, their use is largely in the off-season so far as the manufacturer is concerned. For this fall and the spring of 1943, I see no reason to feel that Florida growers will be unable to get what they need. From now until September, however, Florida supplies are likely to be very limited.

Rotenone: The use of this material, because of its peculiar insecticidal properties, has increased by leaps and bounds during the past ten years. It is essential on certain crops because it leaves no poisonous residue.

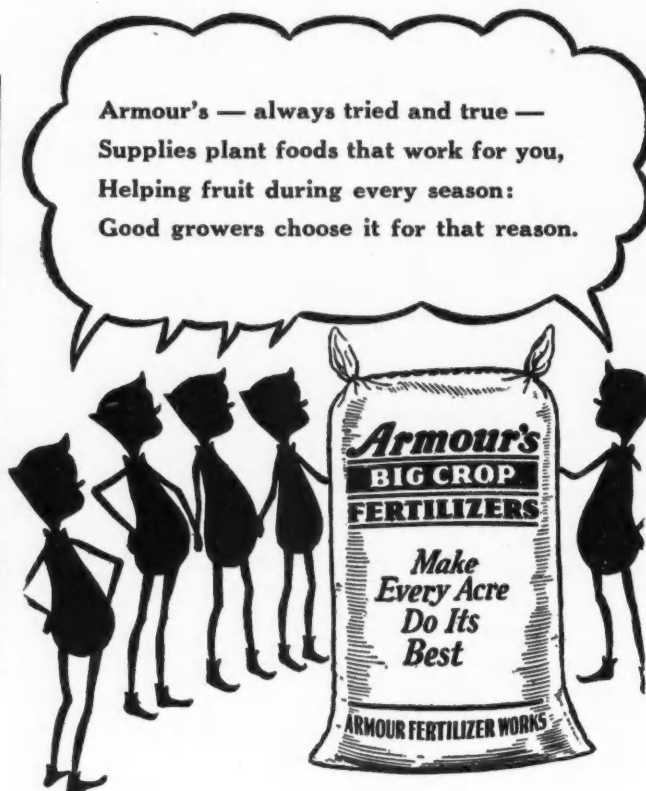
A large part of the Rotenone-bearing root has come from the Dutch East Indies and the Malay Peninsula. With that supply cut off we rely principally on South America. Within two or three years a rather heavy planting in Africa will become available, but in the meantime we face a very definite shortage.

The United States Department of Agriculture is urging the substitution of other materials for Rotenone whenever possible, and to reduce the Rotenone content of dusts to the lowest practical minimum. In most cases a ½% Rotenone Dust of proper physical condition, carrying a wetting or activating agent, is just as effective as a 1% dust. It kills a little more slowly but final results are the same.

Pyrethrum: During the past few years an increasing tonnage of Pyrethrum has been coming in from Kenya Colony, Africa, which has made us independent of Japan. The

(Continued on page 19)

ARMOUR'S
Rich Plant Foods
Act Quickly --
Keep Working
For Finer
Citrus Yields



FOR NEARLY HALF A CENTURY Armour's active plant foods have helped produce big, high-quality citrus yields — by going right to work in the groves, then **staying** at work 24 hours a day.

Armour's BIG CROP is a fertilizer that's **made** in Florida, especially for Florida citrus and soils. It's not only rich in major and minor plant foods, but is prepared according to scientific analyses, so your trees will receive a wholesome, balanced ration at all times, in proportion to their needs.

Many of this state's most successful growers use Armour's season after season — for larger citrus yields that bring higher prices because of superior texture, appearance and juice-quality. You too will find that Armour's BIG CROP is a dependable investment that pays dividends: Order a supply, and let Armour's rich plant foods give **your** grove "The Push That Pays."

Call Your Armour Field Representative
When You Have Citrus Problems



Armour's field representative has had long experience with the groves and soils in your section. He can not only suggest an analysis to suit your citrus, but will gladly help solve any problems of grove care or cultivation which may arise. Drop us a card, and he'll visit you without obligation.

ARMOUR FERTILIZER WORKS
Jacksonville, Florida



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Increased Importance Of Quarantine Inspection

To Florida Fruit and Vegetable Industries During The War

ARTHUR C. BROWN, QUARANTINE INSPECTOR
STATE PLANT BOARD
(Paper Read At Meeting State Horticultural Society)

Today the thought of our leaders and of every loyal citizen is directed towards one end — namely, the winning of the war. Working under terrific pressure and thinking only of the enlistment and training of an adequate armed force, the production of food, and of the manufacture of ships and munitions of war, there is a grave risk of our losing sight of one important fact, namely, that alien plant pests may be as destructive as alien humans.

Several years ago, E. R. Sasscer, In Charge, Division of Foreign Plant Quarantines, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, made a statement somewhat to this effect: Wars are costly, they are cruel, they are destructive. But fortunately they are of comparatively short duration, and the scars are promptly removed when victory has been achieved. But diseases and insects affecting man, animals, and plants, introduced into a country while its vigilance is directed towards overcoming a human enemy, usually remain as permanent aliens and exact tremendous tribute from our children and our children's children in the form of incapacitation and suffering of humans, losses

to live stock and essential crops, and costs for control.

The Hessian fly was introduced into this country in straw carried as bedding by Hessian troops during the Revolutionary war. Competent authorities have estimated that the damage to our wheat crop in a single year as a result of the depredations of this alien amounted to at least 100 million dollars. And the pest has been on the job for some 160 years. Our own Colorado potato beetle was carried into France during the first world war on shipments of Irish potatoes sent over as food for our American Expeditionary Force. The pest established itself in France and rapidly spread into Germany. A press release from that country just prior to the beginning of the present war indicated that the Colorado potato beetle was regarded as the nation's greatest insect enemy and that drastic measures were being taken to combat this insect, which threatened the very existence of a food crop essential to its daily life.

To prevent the entry of fifth columnists, and to hunt out and confine those already within our borders, is the task of a large and highly trained force. Our officials and the

public are solidly behind these individuals and every possible assistance is tendered in order to make their efforts successful.

Likewise, there are trained and efficient individuals, backed by federal laws, whose every effort is directed towards preventing the entry of other fifth columnists, plant pests, that are daily seeking entry for one purpose: to destroy our essential food crops. But there is a vast difference in the support, official and unofficial, afforded the latter as compared with that accorded the former.

At this time when the friendship of a single nation may mean the difference between victory or defeat, our leaders are rightfully seeking to further good neighbor policies, to make treaties that will weld other peoples to our cause, and to make possible the flow of their products into this country. Unless careful thought is given to the grave risk of introducing destructive plant pests on such shipments, and unless the recommendations of plant quarantine officials are given careful consideration, there is a likelihood of destructive plant pests being brought into

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The Importance of Organic Matter In a Soil Management Program For Citrus . . .

By F. B. SMITH, PROFESSOR OF SOILS
FLORIDA COLLEGE OF AGRICULTURE—AT MEETING
OF FLORIDA STATE HORTICULTURAL SOCIETY

The importance of organic matter in soil management involves all the effects organic matter has on soils. Certain of these effects are too well known to be repeated at this time. On the other hand, fundamental principles will always bear repeated attention and close study. It will, therefore, be the purpose in this paper to direct your attention to some familiar experiments which have been conducted right here in Florida, looking at them in a little different way than is ordinarily the custom and possibly to develop a new concept of the soil and organic matter relations.

In a survey of 97 groves on 10 soil types Peech (1) reported a content of organic matter in the soils ranging from 0.89 to 10.6 per cent. The soils on 86 of these groves contained less than 3.0 per cent of organic matter. In only one soil, Grove No. 91 on a Parkwood loam, was the organic matter content as high as 10.06 per cent. The other 10 soils containing more than 3.0 per cent organic matter ranged from 3.05 to 5.50 per cent. Eighty-five of these groves were located on sands and fine sands, one on very fine sand, one on loamy fine sand, five on fine sandy loam, two on sandy loam, one on loam and two on clay loams. If this survey is a representative sample, and it may be safely regarded as such, then less than 2 per cent of the citrus groves in Florida are on soil containing as much as 20 per cent of clay in the surface horizon. This means that the colloidal clay of these soils is contributed almost wholly by the organic matter contained in them. Does one need to further emphasize the importance of organic matter in a soil management program for citrus? If further proof of the need for organic matter in the management of these soils is required, then ex-

amine some of the physical, chemical and biological characteristics of sand.

The sands include all soils of which the silt and clay separates make up less than 20 percent of the material by weight. Their properties are, therefore, characteristically sandy in contrast to the stickier and more clayey nature of the heavier soils. They possess the property of one size of particles largely, the particles are apparent to the eye, feel gritty and non-plastic. They are composed almost entirely of silicon dioxide, an inert and chemically inactive substance. The organic matter in these soils exists principally as a physical mixture. That is, it has nothing with which to react or combine and being less dense than the mineral particles tends to separate. Under the impact of rainfall the organic matter is mechanically carried downward, the soil particles acting as a sieve. Where the water-table is high enough and other conditions are favorable, this organic matter accumulates as a hardpan, as in the Leon soils.

Most soils, even sands, contain a small amount of clay. The finely divided colloidal clay contained in these soils and the decomposing organic matter or humus, also colloidal in nature, form an intimate mixture and react or combine chemically, forming the colloidal complex, the seat of the exchange reactions. This colloidal complex is the only chemically active portion of the soil. These organic colloids are unstable. They are here today and tomorrow they are gone. This is regarded by many as an unfortunate circumstance. Actually, however, just the reverse is the case. It is because of this instability of organic matter that we are able to supplement the inadequate mineral colloids and build up the colloidal clay of sandy soils. This is not an impossible task, but it requires first of all an appreciation of the value of the organic colloids and an understanding of the principles involved.

Since the colloidal clay of these soils

is due largely to the organic matter content, a slight increase in the organic matter content produces a marked increase in the total exchange capacity. The exchange capacity of many of these soils is only about 2.0 milliequivalents per 100 grams of soil and because of the extreme activity of organic colloids an increase of 1 per cent in organic matter may double the exchange capacity. It should be remembered that the converse of this is also true. A slight decrease in the organic matter content of the soil brings about a highly significant reduction in the exchange capacity of the soil. Every grower appreciates the fact that organic matter disappears from the soil rapidly. Stokes et al (2) give some exact information on the rate of loss of organic matter in a pineapple orange grove. They reported a decrease of 32.5 per cent of the total organic matter in the surface 8 inches of soil in seven years under clean culture. With a good summer cover crop of any kind the nitrogen content of the soil was maintained. If the nitrogen content of the soil can be maintained, the organic matter problem is automatically solved.

Unpublished data in the Soils Department of the Florida Experiment Station indicate a relatively low microbial content in Norfolk fine sand under pineapple orange groves. The numbers of molds are particularly low. One reason for this relatively low content of molds in this soil is, undoubtedly, because of the low organic content. There is not sufficient food to support greater numbers. Now the importance of a vigorous microbial population in the soil is too well known to require a further consideration here. When the soil organic matter is regarded as a reserve food supply for the microor-

(1) Peech, Michael—Chemical Studies on Soils from Florida Citrus Groves. Florida Agricultural Experiment Station Bulletin 340. 1939.

(2) Stokes, W. E., R. M. Barnette, H. W. Jones, and J. H. Jefferies—Studies on Summer Cover Crops in a Pineapple Orange Grove. Florida Experiment Station Bulletin 253. 1932.

ganisms and the value of this activity is fully appreciated, one no longer looks upon the rapid disappearance of organic matter in the soil as a calamity but asks what is the proper organic matter content, and how it may be maintained most efficiently. Before entering upon a discussion of these questions, it may be well to consider the nature and some of the properties of soil organic matter.

Soil organic matter or humus as it is often called is a mixture primarily of all the plant constituents in various stages of decomposition. Its constitution varies from day to day and with the kind of plants, the kind of microorganisms and the conditions under which it is decomposed. It is complex and difficult of exact definition because it cannot be separated from the soil without change. Humus is possibly best described as partially decomposed and still decomposing organic matter. This concept implies the final and complete destruction of organic matter and it is the only accurate picture of the conditions as they exist. One can obtain a better idea of this complex by an examination of the plant materials that go into its making, the physical condition and the stage of growth the plants are in when incorporated with the soil.

Plants used for green manures or cover crops may be divided into two classes, namely, the leguminous and non-leguminous plants. As a general rule the leguminous plants are richer in nitrogen than the non-leguminous plants, and this is significant because any plant that does not contain as much as 1.7 per cent of nitrogen will require additional nitrogen for its decomposition. If this nitrogen is not present in the soil or added as a fertilizer, the decomposition stops and the soil may have a serious case of indigestion. Plant materials containing less than 1.7 per cent of nitrogen may be decomposed by the addition of available nitrogen. The course of decomposition and the final products are not the same with the two kinds of materials. Young plants in the vegetative stage of growth contain a higher percentage of nitrogen than the fibrous and woody, mature plants. Under favorable conditions the simple sugars, starch and cellulose contents of plants decompose quite rapidly to carbon dioxide and water. The proteins decompose also yielding ammonia in addition. The lignins, the woody structural part of plants, is more resistant to the at-

tack of microorganisms, therefore, it tends to accumulate and is decomposed only slowly. The lignins are highly active chemically, reacting with the proteins of the decomposing plant materials and possibly with the microbial tissues, forming an even more stable complex. The formation of ligno-protein complex may be compared with the reaction of tannic acid with animal hides to make leather, a rather stable product. It is the lignin and protein fractions of plant materials that contribute directly to the base exchange capacity of the soil. The sugars, starches and cellulose contributes indirectly also by supplying energy for microbial tissues.

The decomposition of even these resistant materials may be relatively rapid under certain conditions of moisture, temperature, aeration and with certain microorganisms found abundantly in most Florida soils. Experiments at Gainesville have shown that the Actinomyces, a little known group of soil microorganisms, form the bulk of the soil micro-flora during the winter months when the moisture content is too low for vigorous bacterial and mold growth. The Actinomyces are extremely active and highly efficient microbes, being able to decompose the most resistant of the organic matter complexes. Thus, the organic matter in Florida soils is attacked from all sides and at all times. Consequently our soils never are able, under normal conditions, to accumulate a high organic matter content. Therefore, it is not practical to attempt to build up the organic content of these soils higher than the organic matter content of these soils in the virgin condition. Thus, the question of how much organic matter should the soil contain is answered. The next question, how may this be done economically may not be so easy to answer.

From the above discussion it is clear that any plant material may be used and that the crop residues are far more important contributors to soil organic matter than is generally realized. Wherever possible a leguminous crop should be used and it should be incorporated with the soil while it is in a green, succulent condition. In old groves it may not even be possible to grow the green manure on the land upon which it is to be used. In such cases it may be necessary to bring in green materials grown on another area. Coarse, woody plant materials should not be incorporated with sandy soils. Ordinarily, it is to be preferred to de-

compose the organic matter in the soil but such materials may better be pre-digested before application to such soils. This introduces another possibility of supplying organic matter to the soils in old groves, namely, that of composting.

Composting is a laborious and expensive process and is not to be recommended for large areas, except possibly where no other method of obtaining organic matter is available at less cost. The process may be practical on smaller areas, such as the market gardens and truck patches.

Composts are usually made of any vegetable materials available locally. Some of these materials make better composts than others. One of these materials usually available abundantly in Florida is peat. Now peat alone does not make a good compost, except possibly for potting soils and for greenhouse work. This is true because peat has already undergone considerable decomposition and is no longer active material. Used in combination with other materials and reactivated peat may be used quite successfully but the cost is usually prohibitive for any large scale operation. There is, of course, no objection to its use where the compost can be made economically. One of the very best materials available for composts in Florida is green crotonaria. This may be used in combination with either green or mature natural grass or other non-leguminous plant materials. Another very excellent plant material abundantly available in Florida is the water hyacinth. Experiments at Gainesville with water hyacinths have shown that a good quality of compost can be made in sixty days simply by stacking the plants in flat rows four feet high and ten feet wide without the addition of water or chemical reagent. One turning of the compost after three or four weeks is all that is necessary. The plant contains sufficient nitrogen and other minerals to insure rapid decomposition. The labor involved in harvesting the plants is the only drawback to their extensive use for this purpose. Some day perhaps a way will be provided to reduce the cost of harvesting and then their use may be quite common.

In composting any materials it is necessary to add nitrogen unless the material contains an abundance of readily available nitrogen, small amounts of phosphorus and potassium and water in abundance. However, too much water should not be applied as the minerals may be

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SMALLER YIELD INDICATED

As of June first, the United States Department of Agriculture estimates that the yield of both oranges and grapefruit will be lighter this year than last season. The estimated reduction in the orange yield is not material, being less than one-half million boxes, but the estimated yield of grapefruit is some 3,221,000 boxes less than a year ago. In the case of both oranges and grapefruit, the reduced yield is accounted for by the estimated Florida yield, where heavy droppage of young fruit due to the dry weather of early spring is partly responsible.

The estimated national production of oranges is placed at 83,546,000 boxes as against a yield of 84,032,000 boxes for last season. This compares, however, with a yield of 60,283,000 boxes for the 1930-1939 average.

The Florida orange yield is forecast at 29,200,000 boxes this season as against 31,100,000 boxes last year, and a 1930-1939 average of 21,290,000 boxes.

California is expected to show a slight increase, the estimate being 50,743,000 boxes against last year's production 49,478,000. However, the statement says, due to a cold spring the California bloom was late and it is hard to make a dependable estimate at this time.

The Texas orange crop is estimated at 2,800,000 boxes, while last year the yield was 2,750,000 boxes, and the ten year average 1,157,000 boxes.

The grapefruit production is estimated at a total of 39,812,000 boxes as against a yield of 43,033,000 boxes last season, and a ten year average of 24,383,000 boxes.

Florida grapefruit production is estimated at 19,400,000 boxes as against a yield of 24,600,000 last year, and a ten year average of 14,760,000 boxes.

Texas is expected to produce 15,100,000 boxes this year as against 13,800,000 boxes a year ago, and a ten year average of 6,350,000 boxes.

These figures, if accurate, and over a period of years the estimates of the Department of Agriculture have usually been pretty accurate, indicate that while there will be no production records broken this season, that there will be ample supplies of citrus fruits to meet the demands of our own consumers and those of our allies to whom we are able to send supplies either in the fresh or concentrated form.

CITRUS GROWERS RESPOND

No class of people, we believe, are responding more generously, more liberally or more willingly to the appeal of President Roosevelt for the contribution of scrap rubber for our war needs, than the citrus growers of Florida. Groves and sheds, fence corners, attics and cellars have been ransacked for old tires, old rubber boots, rubber mats, pads and rain coats which have been hauled to the nearest assembly point to add to the stock pile of scrap so badly needed to defeat the Japs and Huns.

So far as we have learned, the palm for a single contribution by a single Florida individual goes to a citrus grower of Polk county who is shipping ten car loads, (250 tons, 500,000 pounds) to aid Uncle Sam's all-out war effort.

This vast amount of scrap rubber, half a million pounds, had been accumulated to furnish heat and smudge to protect the donor's groves against the possibility of frost next winter. But the nation's war needs come first, and to help meet this need the old tires go to the rubber stock pile to help win the war, while other methods of grove protection must be provided should need arise.

Another citrus grower in Hillsborough county is credited with the contribution of 200,000 pounds, 100 tons of old tires, also accumulated for grove heating purposes, while growers all over the "belt" are hauling in old tires and other scrap rubber in varying amounts — but in all cases to the extent of their supplies. We have yet to hear of the first grower who has withheld for his own use the rubber so badly needed in our war effort. Patriotically they have responded to the appeal of the President, even where their own needs were great.

What this vast store of scrap rubber may mean in the equipment of planes and tanks and trucks for use of the army cannot be estimated, but the citrus growers of Florida have the satisfaction of knowing that they have done their full share toward defeating the enemies of freedom and democracy.

COMMISSION UNCHANGED

Reappointment by Governor Holland of those members of the Florida Citrus Commission whose terms expired in June will, we believe, meet with the approval of citrus growers and shippers generally.

We have not agreed with all acts or policies of the Commission, we have disagreed with some specific acts of the Commission, but we believe that the members of that body have labored faithfully, honestly, and in the main, efficiently, for the best interests of the industry. We doubt if better men could be found to meet the responsible, and frequently thankless, tasks which fall to the lot of the members of that body.

As a citrus grower himself, the Governor is familiar with the needs of the industry and has shown wisdom in his appointments of Commission members.

INCREASED IMPORTANCE OF QUARANTINE INSPECTION TO FLORIDA FRUIT AND VEGETABLE INDUSTRIES DURING THE WAR

(Continued from page 5)

this country.

This good neighbor policy encourages individuals who desire to import from foreign lands plants or propagating material of some essential agricultural commodity the normal supply of which has been curtailed by the war. Some of these citizens are sincere in their convictions that their endeavor is a worthy one, and feel that plant pest restrictions should be suspended to the end that adequate planting stock be imported with the least delay and interference. At times, individuals of the promoter type endeavor to reap a harvest by organizing a stock company for the alleged purpose of importing and growing a certain commodity and building processing plants to convert the raw material into defense materials. Needless to state, their interest in the enterprise does not extend beyond the sale of stock.

It is by commerce that injurious insects, noxious weeds, and fungus and bacterial diseases of cultivated plants become distributed. Gone are the natural barriers presented by vast reaches of ocean, mountain ranges, and deserts, which in the olden days retarded or prevented spread of plant pests. Improvements in the speed of vessels and airplanes, and in the manner of safeguarding and preserving cargoes, have shortened the distance between affected and unaffected countries and increased the risk of invasion. I wonder how many of you know that the Pan American Airways schedule provides for a plane to leave Miami at 8:15 A. M. and fly to Balboa, Canal Zone, and return to Miami at 9:20 the same night?

Entry of some foreign plants and plant products from these countries is prohibited by federal quarantines; the entry of others is permitted under certain conditions. Officials of the Bureau of Entomology and Plant Quarantine responsible for the promulgation and enforcement of plant quarantines feel that the risk of entry of plant pests on commodities allowed entry under permit is slight, for they are subject to inspection on arrival and if infestation is found, treatment, or even exportation, is required. In the larger ports, it is not possible for the limited number of inspectors available to examine

any large portion of the commodities offered for entry. In fact, in many cases only 2% of the entire shipment is examined. The chances of picking up immature stages of some insect by means of such sample inspections are slight. No less an authority than Dr. C. L. Marlatt, former Chief of the Bureau, once stated, with respect to inspection of grapes for fruit fly larvae, that sound and infested grapes may be identical in appearance and to determine freedom from fruit fly it would be necessary to dissect every grape—a thoroughly impossible task.

While Dr. Marlatt was discussing inspection of grapes for fruit fly, his statement as to the effectiveness of inspection for the purpose of locating immature stages of many other pests holds true. The sample inspection probably would detect a heavy infestation—a slight one would probably pass unnoted. Fumigation is the most satisfactory manner of handling importations of plant products. Such treatment is not required by Bureau officials, unless the sample inspection discloses the presence of some plant pest.

These are statements of fact, and are not intended as criticisms of Bureau officials. These men are an outstanding group, able, well trained, conscientious, and fully aware of the need for every precaution to prevent further entry of alien plant pests. But they are only a few striving to be heard above the clamor of expediency and indifference. For twenty years prior to 1912, well informed farmers, agricultural workers, and quarantine officials strove to have enacted legislation seeking to prevent the unrestricted entry of foreign products infested with insects and diseases. Yet it was not until 1912 that the National Plant Act was promulgated. By this time a number of destructive insects and diseases had entered the country. The United States was among the last of the great nations to enact such legislation. Germany, incidentally, as far back as 1873, had prohibited entry of certain plants from the United States on account of the pest risk.

It has been estimated that the costs to American agriculture as a result of attacks by plant pests, costs for control measures, loss of markets on account of quarantine restrictions and allied activities, amount to approximately three billion dollars annually. One half of this expenditure is due to the attacks by native insects and the balance is caused by introduced foreign pests.

The risk of introduction into Florida of foreign plant pests has greatly increased during the past year. Florida, to use a slang expression, has her neck stuck out. On three sides are located foreign countries whose products, oil, sugar, molasses, rubber, and so on, are desperately needed. These commodities, as well as fruits and vegetables destined to New York and Philadelphia, points in the Midwest, and to Canada, which in the past entered at northern ports are now coming into Florida by boat for rail shipment interstate.

The number of service and commercial planes from foreign countries is steadily increasing. At Miami from 9 to 12 planes arrive daily from points in the Bahamas, Cuba, the West Indies, Central and South America. One clipper makes daily round trips to Balboa, Canal Zone. Sugar, molasses, and banana boats arrive almost daily at various ports. Because of the submarine menace, ships no longer radio their time of arrival; Army and Navy aircraft arrive without advance notice at any hour of the day or night. Incidentally, by reason of general orders issued by the Secretaries of War and the Navy, restricting the carrying of plants and plant products on service airships and watercraft, Army and Navy officers in charge at ports of arrival are cooperating fully with our inspectors in preventing entry of plant pests. Due to the lack of advance notice, our men are experiencing great difficulty in planning their work. They frequently work from twelve to fifteen hours at a time—and receive no overtime for their hours of duty.

The boarding of vessels, the examination of manifests to determine nature of cargo, the search of passengers' baggage, cargo, and ship's stores, the interception of prohibited materials, the preparation of necessary papers, and the thousand and one other things which are a part of the plant quarantine routine, would be a hopeless task without the active and cordial cooperation of the United States Customs Service. In Florida, these men go out of their way to assist the plant quarantine inspectors. They are constantly watching for plants and plant products hidden in passengers' baggage and clothing. Mango trees have been removed from passengers' coat sleeves and pockets, fruits from suitcases, and, believe it or not, one citrus leaf heavily infested with black fly from the inside of a pocketbook.

(Continued on page 12)

Experience Is The Most Effective --As The Japs Found At Midway

We Regret Our Inability To Fill All Orders

—But we look forward to
the day when we shall be
able to care for them all

The present world war, like everything else, must eventually come to an end and when it does and the exceptional conditions which now exist return to normal we hope to be able to supply all those prospective new customers whose business we have been unable to care for this season . . . —

We have been able to supply our regular patrons with their requirements and hope to continue to do so . . . —

In the meantime our Superior Extra Value Brands continue to carry all ten vital elements which are every day proving their outstanding value and growing aids to Florida's crops.

**Our Field Service Men Will
Gladly Assist You In The
Consideration of The Un-
usual Production Problems
Which Now Confront You!**

And the Experience
of Hundreds of Florida Citrus Growers
Has Proven Beyond
Doubt the Extra
Value of the Ten
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Superior's Extra
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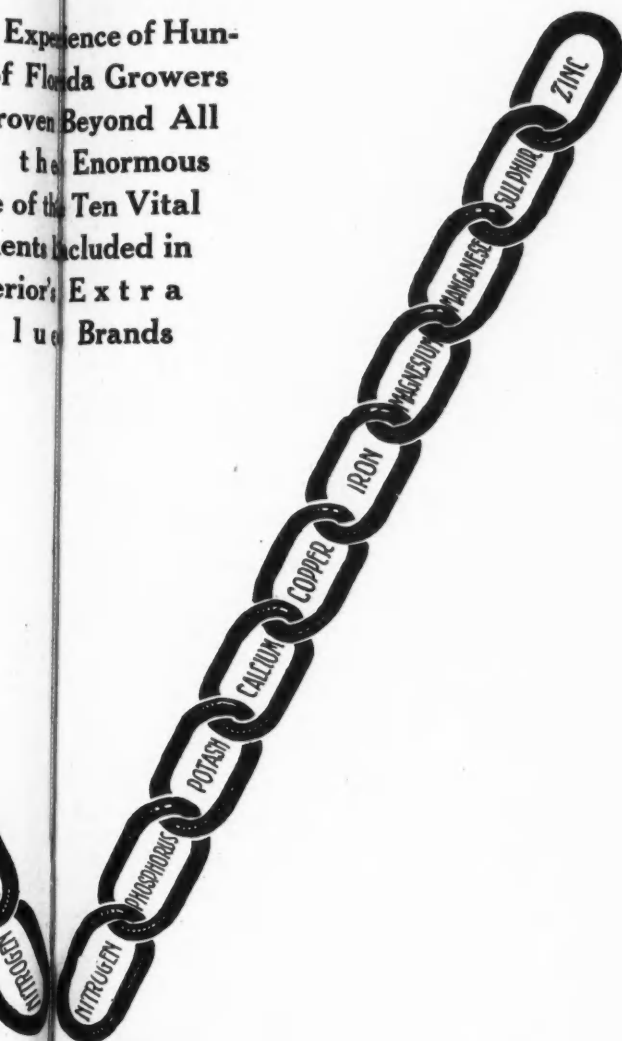
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Superior's Extra-Value Insecticides Supply Adequate

Our storage stock of Extra Value Insecticides is large owing to our anticipation for this season's requirements and the supplies are renewed as soon as present stocks are used.

FOR IMMEDIATE USE WE RECOMMEND

Our Extra Value Spray Oil. A Better Oil Emulsion Containing 83% Oil . . . —

And Our Superior 99-1 Oil. A Better Tank Mix Oil. Contains 99% Oil . . . —

Extra Value Neu-Cop 50% Copper — Far better than most neutral coppers . . . —

Extra Value Wettable Sulphur, 97% Sulphur . . . —

Zinc-Co Wettable Sulphur, 80% Sulphur, 1.75% Zinc, 3.75% Copper . . . —

Z-S Wettable Sulphur, 93% Sulphur, 1.75% Zinc . . . —

SPRAY THE SUPERIOR WAY

—And Secure Maximum Efficiency With Greatest Economy . . . —

Fertilizer Company

J. Sloan, Pres.,
Headquarters At 47th Street, Tampa, Florida

P. O. Box 1021

INCREASED IMPORTANCE OF QUARANTINE INSPECTION TO FLORIDA FRUIT AND VEGETABLE INDUSTRIES DURING THE WAR

(Continued from page 9)

This cooperation, from the Collector down, has been the rule since the work was first started. Florida, in fact, the entire South, owes a debt of gratitude to Mr. Arthur G. Watson, Assistant Collector of Customs, for the part he has performed in making possible the strict enforcement of foreign plant quarantines in Florida. His interest in plant quarantine enforcement has been of inestimable value to Florida's horticulture and agriculture. Indicative of this interest is the fact that Mr. Watson, in spite of the tremendous load he is carrying, has found time to serve as Chairman of the Committee on the Prevention of Entry of Foreign Plant Pests, a subdivision of the State Defense Council's Agriculture Division.

The State Plant Board is charged with the responsibility of preventing the entry of foreign plant pests, holding to a minimum loss due to pests already here, and the eradication, if deemed necessary and practical, of any major pest that might gain entrance. To prevent entry of plant pests, it is necessary that the Board's quarantine inspectors check the entry of all water and aircraft arriving from foreign countries and possessions. In Florida, the same favorable conditions which make possible the production of winter fruits and vegetables likewise make possible rapid development of plant pests. To detect the presence of pests that might have slipped past the quarantine inspectors for the purpose of eradication, if necessary, or control to prevent widespread dissemination, it is necessary that our nurseries, groves, and other plantings be inspected at regular and frequent intervals. Plant pests can be widely spread by means of affected nursery stock. It is a matter of record that the first inspection of exposed citrus trees shipped from canker-infected nurseries brought to light 62 centers of infection scattered through 21 countries. Fifty-six, or 90%, of these infections were found on shipments made from one nursery. (This, incidentally, was prior to the creation of the State Plant Board.) You can appreciate the need for frequent inspections of nursery stock. Our schedule calls for from four to six inspections of each

commercial nursery during the year. Detection of the presence of a major plant pest, or an unusual manifestation of some common one, is possible only through close inspections of our vast citrus plantings. Our schedule calls for the inspection of each citrus tree in the state once every two years. I regret to state that under present conditions it requires about three years to complete the survey.

The greatest problems confronting us are the questions of tires and man power. According to a recent ruling from the Office of the Price Administrator, federal, state, and local government employees are eligible to receive recaps under Classification B. However, it would appear that each local administrator has his own definitions of eligibility and non-eligibility. Several of our employees have made inquiries as to whether or not they could get recaps, and in only one case was the reply in the affirmative. We all recall the disastrous consequences following the lack of a nail needed to shoe a horse. It would be a calamity if the lack of a recapped tire should prevent our inspectors from visiting a citrus grove in which citrus canker, all unknown, is present. It is to be hoped that the state and local rationing boards can be convinced that Plant Board inspectors are entitled, under a ruling from the Office of the Price Administrator, to secure tires, or at least recaps, when such are needed.

As a result of the great increase in foreign traffic, and of the departure of trained men for military service, the burden carried by inspectors at some ports is a heavy one, too heavy for them to carry. It is almost impossible to find qualified men to fill vacancies. The task is one that calls for a man in excellent physical condition, preferably trained in entomology, capable of getting along with fellow workmen, the traveling public, Army and Navy officers, and able to keep in mind the thousand and one restrictions, exceptions, and treatments provided for in federal quarantines.

THE IMPORTANCE OF ORGANIC MATTER IN A SOIL MANAGEMENT PROGRAM FOR CITRUS

(Continued from page 7)

washed out. High temperatures, of course, favor the process. The decomposition is an aerobic process and it is usually necessary to turn the compost to insure thorough aeration. Summarizing the points discussed

Grade And Size Regulation Brings Good Results

The Federal grade and size regulatory program for Florida citrus, which went into effect more than three years ago, has been operated at an annual cost averaging less than \$50,000.00, representing an assessment about one-sixth of a cent a box on this season's shipments, records of the Growers Administrative Committee show.

Each season the budget has permitted a rebate of several thousand dollars to shippers, and it is estimated that between \$4,000 and \$5,000 will be available for return to the handlers at the end of this season, Manager Frank Seymour of the GAC said recently.

The Growers Administrative Committee and the Shippers Advisory Committee, whose 1942-43 members will be nominated at industry meetings scheduled next week, have a two-fold job which represents hundreds of thousands of dollars to growers and handlers each season.

They make recommendations to the Secretary of Agriculture on grade and size restrictions advisable on interstate shipments of oranges, grapefruit and tangerines, and they serve as the industry contact with Washington on Federal purchase programs, requesting purchases when needed and handling allocations.

There is no accurate way to estimate the amount of money the Committees have made or saved for the industry in three and a half seasons of operation, but improved market levels testify to the fact that elimination of off-grade and off-size fruit from interstate commerce has meant money in the grower's pocket, well qualified observers point out.

in this paper, the physical, chemical and biological characteristics of the predominant soils planted to citrus together with analyses and the results of cover crop experiments have been given. The transitory nature and properties of organic matter, and its role in soils have been discussed. The different methods of organic matter maintenance, including composting, for the citrus grove were briefly reviewed.

Waste fats from the home kitchen are badly needed in the Nation's war efforts. Florida housewives are urged not to throw away a single drop of used cooking fats of any kind.

Use of Fungicides In War-Time

By W. B. TISDALE, PLANT PATHOLOGIST, FLORIDA EXPERIMENT STATION

Strange as it may seem, those materials most valuable in fighting plant diseases are among those most needed for fighting enemy soldiers. These important materials are copper, chlorine, mercury, formaldehyde and zinc. The production of food is considered second in importance to the production of actual munitions, and there is an increasing demand for both. To produce food crops of the desired quality and quantity, it is necessary to use fungicides and insecticides to protect them from insect and fungous pests. The war has affected control of crop pests both directly and indirectly. Supplies of several materials needed both for actual war munitions and for control of crop pests have been reduced or cut off by invasion of producing countries, and present facilities cannot supply the total required. Of all metals used for both purposes, copper and mercury are most seriously affected. The supply of these materials for use as fungicides in 1942 has been estimated to be fairly adequate, but the outlook for 1943 is gloomy. Our problem, then, is doing the best job of pest control with a minimum of vital materials. This will necessitate some compromises and changes in the spray programs, and closer observation of the crops by growers. Today, I will discuss several means for effecting a saving of fungicides and for a more effective use of a limited supply.

There are perhaps many means for saving materials, and many growers probably are already employing several of them. Some of the most important ones that occur to me are: (1) to limit their use to troubles that can be controlled, (2) to treat crops that are likely to be most in need, (3) to improve the efficiency of distribution over the plants, and (4) to give careful attention to the amounts used and to the time of their application. I will discuss briefly each of these points, and hope growers will find it feasible to use them or others which may effect a saving of materials without lowering the quality of food.

First of all, accurate diagnosis of a plant disease must precede correct treatment. Too often mistakes in diagnosis are made and material is ap-

plied where no treatment would do any good or when another kind of treatment is needed. For example, tomatoes and watermelons affected by wilt diseases are often sprayed under the supposition that they are affected with a leaf spot disease. In both cases the leaves die, but a careful observation in the case of wilt would show that the leaves wilted first and then died. In the case of leaf spots, the leaves become spotted before dying. Applying a fungicide would have no effect on the wilt disease, but would protect the foliage from leaf spot.

As another example, bean leaves may turn "rusty" from any one of several causes and the tendency is to spray or dust with copper without determining cause of the trouble. If the trouble is a true rust, sulphur is the correct fungicide to use and copper would be of no value.

Correct diagnosis is sometimes difficult, even for the expert, and because of this one should study the condition carefully before applying treatment. Various bulletins are available to help growers in diagnosing plant diseases. Also, the Extension Service and Experiment Stations are glad to help when possible. Because of the restrictions of travel by representatives of these agencies, growers should send specimens by mail for diagnosis. The specimens should represent various stages of the trouble and the whole plant is preferable whenever the size will permit mailing conveniently. They should be collected just before mailing, wrapped with waxed paper or moist paper and packed so they will not be crushed in transit. There should be an accompanying letter giving information on prevalence of the trouble in the field, the fertilizer practices, variety, rotation system used, and weather conditions.

In Florida most of the control measures are used to improve both quality and quantity of the crops. In some cases it is possible to sacrifice some of the quality and thus save materials for increasing quantity production of other crops. It is probably even more advisable to discontinue using the materials on non-agricultural or unimportant crops and apply them on essential crops

where they will do most good.

The use of an "all-purpose" dust or spray on vegetable crops has been practiced by many growers. Such a mixture contains both a fungicide and an insecticide, and its use has avoided the necessity of selecting the proper material for each pest. This practice was wasteful in time of plenty and should be discontinued now. Whenever insects only are attacking the crop, a fungicide in the "all-purpose" dust or spray adds nothing to the effectiveness of the insecticide and may do some harm.

Sprays and dusts are applied to plants to kill some pest living on them or to prevent trouble later. To obtain greatest protection they are applied in advance of the attack to produce a layer over all the foliage so that no pest arriving afterward can attack the foliage without being killed. Incomplete coverage gives poor or no protection and the materials applied are largely wasted. Therefore, it is important to apply the materials in such a manner that they cover all above-ground parts of the plants without wastage. A comparatively large nozzle opening produces a coarser spray which reaches and covers the inner leaves better than fine nozzle openings producing a "mist". Of course, the larger nozzles apply more gallons per acre, but this effect can be offset by reducing the concentration of the spray material. Better protection is obtained by covering all parts of the leaves with a dilute fungicide than by covering only a part of the foliage with a more concentrated one. Coverage with the fungicide can be further improved by adding a good spreading and sticking agent, when one is not already included in the fungicide. Much dust material is wasted by attempting to apply it when a wind is blowing, when the plants are too dry for the dusts to stick and by poor methods. If these conditions are not favorable, dusting should be postponed to another day. Neither dusts nor sprays can be most effective when "drifted" onto the foliage, especially on the under surfaces where they are often most needed. They must be directed there with machinery that is designed

(Continued on page 18)

Analysis Of Data Relative To The Maturity Of Florida Early and Midseason Common Sweet Oranges, Seasons 1938, 1939 and 1940

By WILLIAM E. LEWIS
Agriculturist Economist 1/, U. S.
Department of Agriculture

Introduction

Data on solids, acidity and volume of juice of Florida oranges were obtained during the seasons of 1938, 1939, and 1940, under practical com-

mercial operations. These data appear to agree with those from experimental studies 2/ and to substantiate the general expert opinions regarding the behavior of internal characteristics of oranges.

This study is based upon an analysis of official inspection certificates issued in accordance with regulations covering the enforcement of the maturity laws of the State of Florida. These certificates covered more than 10,000,000 boxes of oranges and were issued during periods from October 8 to December 30 of the years 1938 and 1939, and from October 8 to December 2 in 1940.

Percentages given in tables 1 to 6 for 1938 and 1940 were based up-

on the actual number of boxes of fruit covered by certificates, whereas the percentages for 1939 were ascertained from a cross section of representative tests made throughout the season in various districts and packing houses.

Tables have been arranged to show progressive changes in average percentages of solids, acidity, and juice content, by weeks, throughout the maturity inspection period (October through December). Percentages are based upon State averages of composite tests and indicate the quantity of oranges that met various minimum requirements when tests were made.

Because of the impracticability of distinguishing between varieties, the

- 1/. Acknowledgement is made to the Surplus Marketing Administration for certain data for 1939, and to the Florida Citrus Inspection Bureau for clerical assistance.
- 2/. "Seasonal Changes in Florida Oranges," by Dr. Paul L. Harding, U. S. D. A. Technical Bulletin No. 753. See also "Relation of Size of Fruit to Solids, Acid and Volume of Juice in the Principal Varieties of Florida Oranges," by Dr. Paul L. Harding and William E. Lewis. (A paper presented before the Florida State Horticultural Society, Orlando, Fla., April 17, 1941.)

Table 1. Total soluble solids in Florida oranges, 1938, 1939, and 1940. Percentages of weekly movement that met stated specifications

8 Percent or More Solids												
Year	Oct. 8-14	Oct. 15-21	Oct. 22-28	Oct. 29- Nov. 4	Nov. 5-11	Nov. 12-18	Nov. 19-25	Nov. 26- Dec. 2	Dec. 3-9	Dec. 10-16	Dec. 17-23	Dec. 24-30
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1938	98	99	99	99	100	100	100	100	100	100	100	100
1939	84	90	94	92	96	98	100	100	100	100	100	100
1940	100	100	100	100	100	100	100	100	-----	-----	-----	-----
Avg.	94	96	98	97	99	99	100	100	100	100	100	100
8.5 Percent or More Solids												
1938	89	90	94	97	99	99	99	100	100	100	100	100
1939	51	61	72	79	91	92	99	98	99	99	99	100
1940	93	99	99	100	100	100	99	100	-----	-----	-----	-----
Avg.	78	83	88	92	97	97	99	99	99	99	99	100
9 Percent or More Solids												
1938	64	73	80	87	94	96	99	99	99	99	99	100
1939	28	36	44	56	76	82	95	93	97	98	98	99
1940	75	80	92	95	96	98	99	100	-----	-----	-----	-----
Avg.	56	63	72	79	89	92	98	97	98	98	98	99
9.5 Percent or More Solids												
1938	36	50	59	71	84	90	95	96	95	98	98	98
1939	16	23	22	34	53	64	85	82	90	94	95	98
1940	40	56	69	81	91	92	97	97	-----	-----	-----	-----
Avg.	31	43	50	62	76	82	92	92	92	96	96	98
10 Percent or More Solids												
1938	15	25	36	46	61	74	80	87	89	92	93	93
1939	6	10	9	18	26	40	59	65	77	84	90	91
1940	28	30	37	49	65	76	87	90	-----	-----	-----	-----
Avg.	16	22	27	38	51	63	75	81	83	88	91	92
10.5 Percent or More Solids												
1938	3	7	13	22	35	49	54	65	75	76	78	81
1939	2	2	4	6	11	19	34	43	55	66	70	74
1940	22	10	13	24	39	59	67	77	-----	-----	-----	-----
Avg.	9	6	10	17	28	42	52	62	65	71	74	77

Total number of boxes or tests upon which this table is based: 1938..... 7,403,048 boxes
1939..... 7,027 tests
1940..... 3,070,515 boxes

data for all lots of the common sweet oranges are averaged.

The "A" specification referred to in this report is based upon a study of Dr. Paul L. Harding's work and was drawn up to provide for pleasantly tart and sweeter oranges. As used in this report it does not include requirements for volume of juice. A study of table 3 indicates that a minimum juice requirement of 4.5 gallons of juice per standard box would not appreciably affect the amount of fruit meeting the "A" specification.

A study of data herein presented indicates the percentages of fruit that might reasonably be expected to meet the "A" specification. The data also can be used to indicate the probable effect of other specifications, such as different percentages of solids and acids, and they can be used in the determination of a requirement for volume of juice. Consideration, however, should be given to the fact that the data presented here are based upon averages of composite tests and not upon tests of individual oranges. Any requirements based upon tests of individual oranges would cause a slight reduction in the indicated quantity of fruit that would have met the various specifications shown in the accompanying tables.

It is believed that these data, together with the results of published studies, should be of material aid in establishing practical standards for internal quality of oranges.

The percentages of oranges that met various minimum specifications for total soluble solids during weekly periods in each of the maturity inspection seasons of 1938, 1939, and 1940, are shown in table 1.

It will be noted that as the season progressed the solids increased. At

the end of December, 81 percent of the oranges inspected contained at least 10.5 percent solids. Unquestionably much higher solids would have been found during the movement of Valencia oranges later in the season.

In 1938, during the week of Oc-

(Continued on page 18)

Table 3. Volume of Juice in Florida oranges, 1938, 1939, and 1940. Percentages of weekly movement that met stated specifications for gallons of juice per standard packed box of 1 3-5 bushels. (Data represents State averages of composite tests of all sizes of fruit.)

4.5 Gallons or More								
Year	Oct. 8-14	Oct. 15-21	Oct. 22-28	Oct. 29 Nov. 4	Nov. 5-11	Nov. 12-18	Nov. 19-25	Nov. 26 Dec. 2
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
1938	100	100	100	100	100	100	100	100
1939	100	99	99	100	100	100	100	100
1940	84	98	100	99	100	99	100	98
Average	95	99	100	100	100	100	100	99
4.7 Gallons or More								
1938	98	99	99	99	99	99	99	99
1939	93	96	96	97	97	97	96	97
1940	77	88	93	93	97	97	97	93
Average	89	94	96	96	98	98	97	96
5 Gallons or More								
1938	79	87	84	89	89	91	92	93
1939	49	60	59	70	74	73	74	78
1940	44	43	52	57	65	65	67	65
Average	57	63	65	72	76	76	78	79
5.5 Gallons or More								
1938	9	9	11	10	7	9	11	14
1939	3	6	6	9	7	7	7	8
1940	3	3	2	5	4	6	4	4
Average	5	6	6	8	6	7	7	10

Total number of boxes upon which this table

is based: 1938..... 3,534,054 boxes
1939..... 3,855,272 boxes
1940..... 3,039,656 boxes

Table 2. Anhydrous citric acid in Florida oranges, 1938, 1939, and 1940. Percentages of Weekly movement that met Stated specifications

0.7 Percent or More Citric Acid												
Year	Oct. 8-14	Oct. 15-21	Oct. 22-28	Oct. 29 Nov. 4	Nov. 5-11	Nov. 12-18	Nov. 19-25	Nov. 26- Dec. 2	Dec. 3-9	Dec. 10-16	Dec. 17-23	Dec. 24-30
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Pct.
1938	86.6	98.3	97.6	97.5	97.5	97.9	98.4	99.3	98.9	99.9	99.5	99.7
1939	77	80	83	87	89	90	93	95	98	99	99	99.8
1940	87	94	99.3	100	100	99.9	99.4	99.3	—	—	—	—
Avg.	84	91	93	95	95	96	97	98	98	99	99	100
0.6 Percent or More Citric Acid												
1938	99.7	100	99.7	99.4	99.8	99.7	99.6	99.9	99.9	99.9	99.9	100
1939	96	98.5	98.4	96	97	97	99	99	99.5	100	100	100
1940	89	95	99.4	100	100	99.9	100	99.9	—	—	—	—
Avg.	95	99	99	98	99	99	99	100	100	100	100	100
0.5 Percent or More Citric Acid												
1938	100	100	99.9	100	100	99.9	99.9	100	100	100	100	100
1939	98	100	100	99.8	99.8	99.9	99.8	100	100	100	100	100
1940	89	95	99.4	100	100	100	100	100	—	—	—	—
Avg.	96	98	100	100	100	100	100	100	100	100	100	100
0.4 Percent or More Citric Acid												
1938	100	100	99.9	100	100	99.9	99.9	100	100	100	100	100
1939	99.3	100	100	100	100	100	100	100	100	100	100	100
1940	99	98	99.5	100	100	100	100	100	—	—	—	—
Avg.	99	99	100	100	100	100	100	100	100	100	100	100

Total number of boxes or tests upon which this table is based: 1938..... 7,403,048 boxes
1939..... 7,027 tests
1940..... 3,070,515 boxes

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WEST CENTRAL FLORIDA

E. A. (Mac) McCartney

This territory has had some good rains during the past few weeks which have been responsible for citrus trees making a nice response to summer fertilizer application. These rains also were partially responsible for discontinuation of fruit droppage. This matter of fruit dropping had become very serious throughout the section, and in many cases I saw grapefruit on the ground as large as golf balls. The vegetable deal in this section is just about over with the exception of small plantings of eggplant and pepper that still moves to market. The price on these commodities is holding up well. Most of the growers in this section had a successful year and are now looking forward to the coming season.

HILLSBOROUGH & PINELLAS COUNTIES

C. S. (Charlie) Little

There are still several crops of Valencia oranges in this territory to be moved to market. We also have a few crops of Marsh seedless grapefruit left. Prices are good. The rains have been very beneficial in setting fruit and have also helped in getting cover crops started. Most of the groves in this section are seeded with crotalaria, beggar weed and cow peas and the stand and growth is excellent. As far as the crop of fruit is concerned it is difficult to make a very accurate estimate at this time. It now appears that some groves are carrying an unusually heavy crop while others are light to fair crops. However, I feel sure that when we start moving fruit next fall we will have plenty of fruit to place on the market.

POLK COUNTY

J. M. (Jim) Sample

The summer fertilizer application is now completely finished in this section. Summer rains starting early have put most groves in very fine shape with good cover crops on the way. It has become necessary to spray most groves with oil to control scale insects and this operation will probably be completed by August 1st. The

new fruit crop is showing up better as sizes increase and it now appears that we will have a normal crop in this section. Nearly all normal Valencia crop has been moved to market and there is now a demand for late bloom Valencia oranges and Marsh seedless grapefruit.

SOUTHWEST FLORIDA

F. W. (Felton) Scott

We have had some nice rains in this section which have been very beneficial to citrus growers and the young fruit is developing very nicely. Practically all the Valencia crop has been moved and the prices have been good. The droppage of young fruit has been far greater than normally expected and this will of course have a marked effect on the tonnage for the coming season. However, with all this droppage a fair crop of fruit is expected throughout the section for the coming season. We are recommending quite generally an application of oil for control of scale insects and this should be applied immediately as these pests are now quite active. There is still some movement of eggplant and pepper from this section at prices considered good.

NORTH CENTRAL FLORIDA

V. E. Bourland

We have just finished moving the season's fruit to market and growers throughout this section have quite generally made a profit over the year. Our new crop of fruit is more or less spasmodic—in other words some groves are carrying a nice crop of fruit while others are setting a very light crop. It appears that mid-season fruit will be lighter than other varieties. Watermelons have been moving to market from this section at very good prices. From all that I have seen it certainly appears that crops grown with Lyons Fertilizers have been of much better sizes than the crops in general. From all reports that I can get there seems to be very little disagreement regarding this point. We are about through with summer application of fertilizer to groves and citrus properties as a whole are in very fine shape.

Horticultural Hints

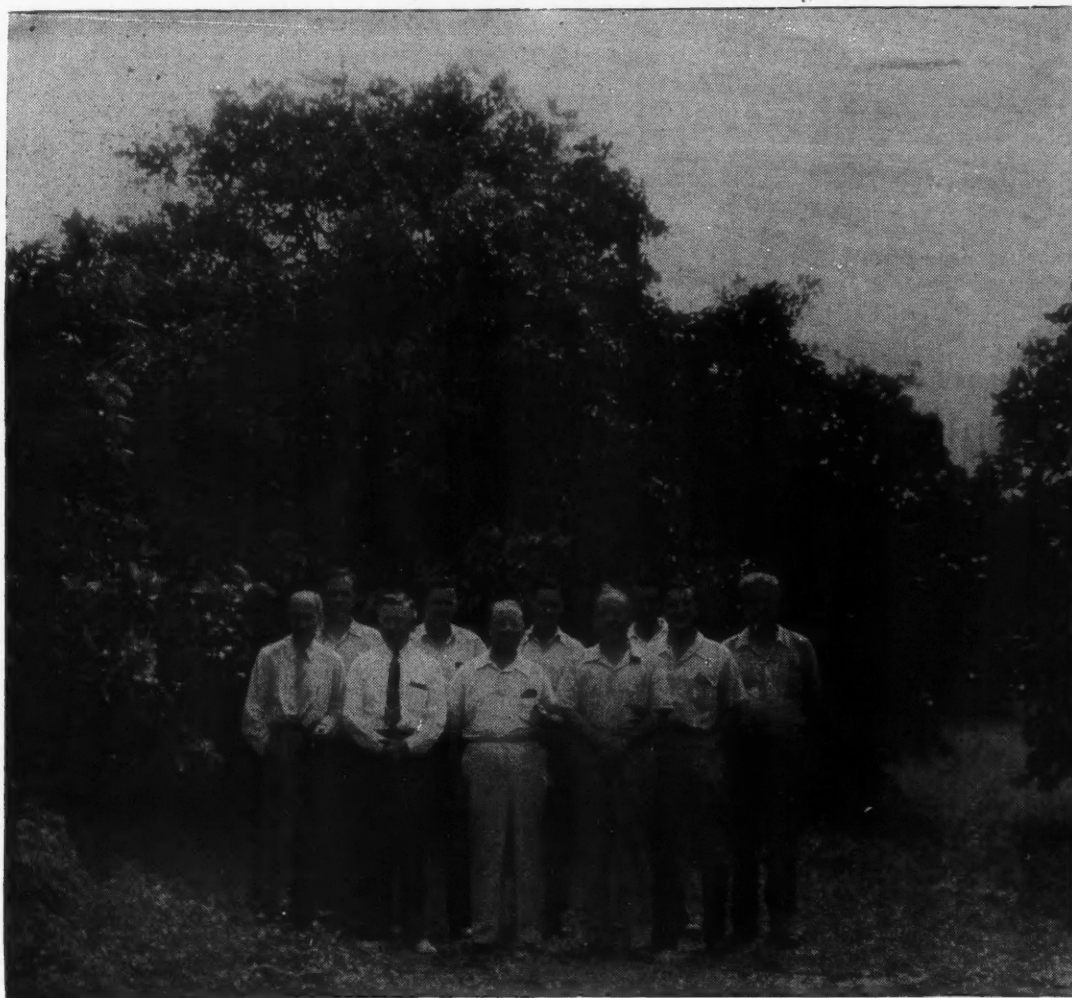
With the summer application of fertilizer applied and the grove ready to go through the summer, it would be well to give some thought to the many minor details that are to be cared for on the property. There is no doubt but that you have felt the scarcity of labor and for the next two or three months you will be able to obtain labor to do the many detailed jobs that are necessary in keeping the property in tip-top shape. Pruning is one of the most important jobs that should be cared for at this time. Ditches should be cleaned in all low places, fences should be put in proper repair, the barns should be cared for, all equipment should be painted and made ready for future work, and there are many other things that can be done this summer while it is possible to get help before the fall busy season gets under way.

Scale insects have caused us lots of trouble during the past few years and from all indications at this time we are going to have trouble again this summer. We have found scale insects to be quite prevalent and we urge all growers to make application of oil at this time to control these pests. Scale insects can do lots of damage not only to the foliage and woody part of the tree but severe infestations will mar your fruit and cause it to be graded into a low grade this fall.

Rust mite are quite active at this time and should be placed under control. It takes only a short time for mites to damage fruit and consequently it is necessary to keep a close check for the appearance of mites.

Young trees should be given attention all during the summer months. Just a little dry weather and new set trees will begin to suffer. If necessary water at frequent intervals. Fertilize the young trees often and keep the tree row thoroughly cultivated.

ADVERTISEMENT—LYONS FERTILIZER COMPANY



Pictured Above Are Ten Good Reasons For The Success of The Lyons Program.....

Shown in the picture above are the majority of the Lyons Fertilizer Company staff of Field Men. It was taken during a recent inspection tour, when this group of men visited various groves in nearly every section of the citrus belt of Florida.

At regular intervals the entire staff make these inspection tours together in order to study growing and production problems as a group and to determine just what may be the best methods to pursue in the development of the finest crops of fruits and vegetables.

All of these men are trained observers, with a sound background of practical as well as technical training. Their objective is to see that each Lyons customer is given the soundest possible advice as to the most economical and effective program for producing the most profitable crops.

THESE MEN ARE AT YOUR SERVICE

USES OF FUNGICIDES IN WAR - TIME

(Continued from page 13)

for an in condition to do the job.

Since the use of fungicides is a form of insurance, naturally they must be applied before the damage is done. As a matter of simplicity for the grower, schedules, such as once a week, have been worked out to produce the maximum protection. This was done because of the uncertainty in weather conditions and of the inability of many growers to correctly diagnose diseases in their early stages of development. Such a schedule can be wasteful of materials, and it can be changed with a saving of materials, provided growers will carefully observe the plants and weather conditions. Leaf diseases do not develop much in dry weather and during such periods frequent treatments are unnecessary. Moreover, frequent applications of bordeaux mixture to potatoes, tomatoes and perhaps several other crops reduce the yield if no pests are present. Under such conditions material can be saved by waiting until a few disease spots appear, or until weather conditions become more favorable for

their development. Unfortunately, some growers are inclined to wait too long to begin treatment and as a result waste much of the material they apply. In such cases the material can be used to better advantage on a crop that can be saved. In some instances the interval between treatments can be extended without reducing control seriously. This is especially true when the weather is dry or cool and the plants are growing slowly. In any case the grower can create an appreciable saving by carefully watching the plants and weather, and applying the treatment when conditions indicate a need for it.

Although much of the shortage of copper can be met by more efficient use of materials, organic materials may be substituted in some cases. The number of these that have shown promise is not great, but enough information is available to justify use of three of them for certain purposes. It is probable that further trials will broaden their field of usefulness. Tetramethyl thiuram disulfide (TM-TD) and ferric dimethyl dithiocarbamate (Fermate) have shown promise on tomatoes and roses for leaf diseases and the latter has been very effective for the control of downy mildew of cabbage and tobacco. TM-TD and chloramil (Spargon) can be used for seed treatments to replace copper and mercury. TMTD also has proved to be a good substitute for mercury in preventing turf diseases.

It is hoped that these suggestions will encourage growers to make an effort to obtain the greatest benefit from a diminishing supply of fungicides.

ANALYSIS OF DATA RELATIVE TO THE MATURITY OF FLORIDA EARLY AND MID-SEASON COMMON SWEET ORANGES, SEASONS 1938, 1938 AND 1940.

(Continued from page 15)

tober 8 to 14, 98 percent of the movement of oranges met a minimum specification of 8 percent solids; during the period from October 15 to October 28, 99 percent of the fruit contained not less than 8 percent solids; and from October 29 to December 30, 100 percent met an 8 percent minimum of solids. During the week of November 5 to 11, 99 percent of the oranges met a minimum specification of 8.5 percent solids; 94 percent met a 9 percent minimum; 84 percent met a 9.5 percent minimum; 61 percent met a 10 percent minimum; and 35 percent met

a 10.5 percent minimum of total solids.

(Concluded next month)

Careful handling of bags to permit repeated use will help solve the bag shortage induced by the war.

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PLACE ORDER NOW Fall Delivery Citrus Trees. All Varieties. Paramount Grove Service, Box 843, Lakeland, Fla. 10-6t

LAKE GARFIELD NURSERIES COMPANY
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ALL STANDARD VARIETIES CITRUS TREES—SPECIAL PRICES
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NICHOLSON'S EARLY ORANGE—This outstanding orange of high juice content and rich and very delicious flavor during earliest maturity **SHOULD** and **WILL** bring high premiums. \$3.00 to \$7.00 per box can be realized if properly handled. Royal Purple Citrus Research Nursery, Orlando, Florida.

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The power of the greatest Navy in the world, our own two-ocean fleet, rests in large measure on its backbone—the Battleships of the Line. They displace approximately 35,000 tons and cost up to \$70,000,000. We have something like a score of these huge ships in the Atlantic and Pacific.



Eight huge battleships are under construction and more are contemplated. To finance these modern goliaths of the sea it is necessary for every American everywhere to buy more and more War Bonds. We can do it if everybody does his share. Invest at least ten percent of your income every pay day to help your country go over its Bond Quota.

U. S. Treasury Department

THE INSECTICIDE SITUATION

(Continued from page 3)

quality is much better than Japanese Flowers. The only difficulty right now is getting shipping space. The steamers are in such a hurry to get back that they do not like to stop to load part cargoes of very bulky material.

Aside from the transportation difficulties and the substitution of Pyrethrum for Rotenone wherever possible, we should have ample supplies of Pyrethrum. Here again our main Florida demand comes during the off-season in other territories.

Nicotine: The supplies of Nicotine for agricultural purposes are somewhat below normal, and the demand heavier. However, it appears that we should expect to have reasonable supplies for the balance of the spring season. By fall the principal demand in other sections will have slowed up and we should be able to get what we need.

Miscellaneous Items: There are numerous synthetic insecticides coming into general use, and many of these are likely to be very difficult to get. Such shortages will be due primarily to the inability of the large chemical plants to devote any of their capacity to such items, which represent a relatively small volume.

I have tried to give you as briefly as possible a concise picture of the situation on the principal insecticides which are of interest to you. I am now going to give you a few suggestions as to how you can help the insecticide industry take better care of your requirements.

While it appears that with few exceptions we should have sufficient supplies of essential materials, there are several ways you can cooperate to assist in the situation:

(1) Don't insist on having materials available for immediate delivery at every convenient point. A car of a certain material in a central stock might serve the requirements of many growers, whereas this car scattered among a dozen points would not be enough in any one place to do much good.

(2) It is human nature for a manufacturer or supplier to sell what he has, when he gets the orders. Therefore, don't expect all suppliers to hold materials against your possible demand when they could sell them at once and get their money from customers who are more definite about their needs.

(3) Don't order more than you are going to need, with the thought of

returning the surplus when your requirements are satisfied. This may deprive some other customer, and it also entails a considerable amount of extra expense.

(4) If you're spraying or dusting, do the job thoroughly. You may use more material per application but it may save going over a second or third time.

(5) Anticipate your requirements as much as possible, particularly those of you who ask for truck delivery. Many truck miles can be saved by a little better planning.

(6) Last, but not least, is the drum situation. Return your drums as promptly as possible to the manufacturer from whom you bought the material. Keep them in good condition — don't let them stand out in the sun and rain to rust out.

I have not attempted to touch on the spraying and dusting machine situation, but I would like to bring up a few items of utmost importance.

There is a definite shortage of high pressure spray hose. Conserve it and take good care of what you have.

We cannot furnish any aluminum replacement parts unless you send us either the part to be replaced or

a receipt from a junk yard showing you have sold it.

The production of food crops is one of the essentials of the war effort, and insecticides must be available to protect these crops. Washington has shown its recognition of that fact by releasing raw materials to the insecticide industry. We of that industry appreciate our responsibility and shall do our best to serve you.

YOUR OWN quota,
is 10%!

★ ★ ★

Lend your country 10% of your pay or have the Nazis and Japs take (not borrow) 100%!

That's what we and every one of us face today!

Victory or defeat!

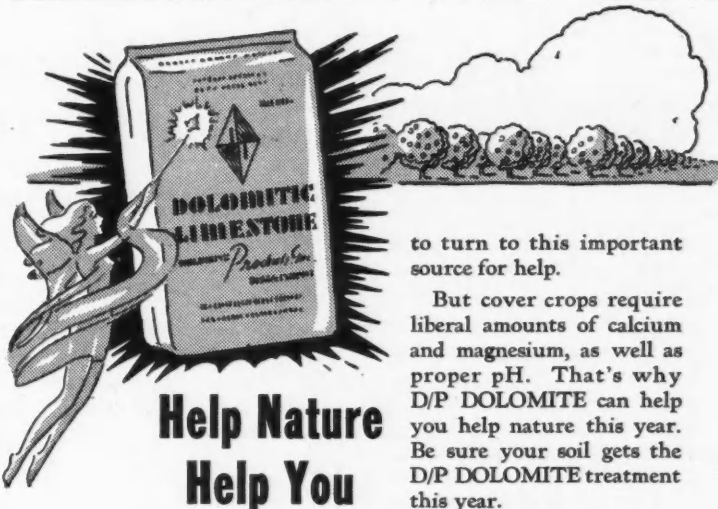
Buying War Bonds or selling ourselves into slavery!

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Your quota—and everybody's quota—is 10% of wages or income saved in WAR BONDS and STAMPS!

Join America's all-out offensive... increase your WAR BOND savings to at least 10%—NOW!

Get the details from your employer, bank, post office or other WAR BOND sales agency... TODAY!




**Help Nature
Help You**

Nitrogen from cover crops means a natural supply of this essential food. And with the impending fertilizer material shortage, you're forced to turn to this important source for help.

But cover crops require liberal amounts of calcium and magnesium, as well as proper pH. That's why D/P DOLOMITE can help you help nature this year. Be sure your soil gets the D/P DOLOMITE treatment this year.

At your fertilizer dealer, or direct.



KEEP 'EM BALANCED!

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Florida Growers Have Done A Fine Job This Season--

Now is the time to plan for the job which
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Everyone knows that we are confronted with handicaps—handicaps which at times have seemed unsurmountable, but Florida growers have gone through many critical seasons in the past and have always survived.

We will be called upon to make sacrifices and to endure hardships which will tax our ingenuity to the utmost, but as in the past, we will overcome every obstacle which may confront us.

Our job is to produce the greatest possible quantity of fine fruits and vegetables it is possible for us to raise, and while temporarily we are obliged in some instances to vary our normal production programs, we will do the job.

Our field men are in position to offer Florida growers timely and effective counsel — and will welcome the opportunity to discuss your problems with you. Their specialized knowledge will enable these men to serve you effectively.

LYONS FERTILIZER COMPANY

TAMPA, FLORIDA

LYONIZE

YOUR CROPS